

**BY ORDER OF THE COMMANDER
AEROSPACE MAINTENANCE AND
REGENERATION CENTER**

AMARC MANUAL 21-116

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Maintenance

CENTER QUALITY ASSURANCE MANUAL



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This manual implements Air Force Instruction (AFI) 21-101, *Maintenance Management of Aircraft*, Air Force Policy Directive (AFPD) 21-1, *Managing Aerospace Equipment Maintenance*, AFMC Policy Directive 21-1, *Depot Maintenance Policy*, AFMC Instruction 21-110, *Depot Maintenance Technical Data and Work Control Documents*, AFMC Instruction 21-115 *Depot Maintenance Quality Assurance* and AFMCI 21-108, *Maintenance Training and Production Acceptance Certification (PAC) Program*. This instruction applies to all AMARC activities.

SUMMARY OF REVISIONS

This is the initial manual.

1. General. The purpose of this manual is to establish procedures and responsibilities for operation of the AMARC Quality Assurance (CC-QA) Office. The small size of AMARC allows the use of a single quality organization. Quality is the responsibility of all AMARC employees. The role of CC-QA is to manage the quality assurance programs. This includes assessing, analyzing, and identifying problem areas; investigating activity quality capabilities and resources and recommending policy changes or adjustments or resources for specific situations; assessing quality training; determining aircraft and equipment condition; and increasing reliability and maintainability. Aircraft/equipment condition and personnel proficiency is assessed through the quality assurance program. CC-QA assists in identifying trends and problem areas by collecting performance data through inspections and special assessments, recommending possible corrective actions to supervisors and by providing on-the-spot assistance. CC-QA involvement during the planning of quality requirements and systems development during the planning phase of future AMARC short term and long term workloads is paramount. CC-QA personnel will utilize available Air Force Materiel Command (AFMC), Inspector General (IG) and local checklists to evaluate the effectiveness of the Quality Assurance Program.

2. Quality Assurance Programs. CC-QA is the office of primary responsibility (OPR) for the programs listed below:

- 2.1. Center Quality Assurance Program.
- 2.2. Aircraft/Equipment Impoundments.
- 2.3. Product Improvement Program.
 - 2.3.1. Deficiency Reporting (DR) (Quality-QDR/Material-MDR).
 - 2.3.2. Technical Order Improvement (Air Force Technical Order (AFTO) Form 22, Technical Order Improvement **Report and Reply**).

3. Quality Assurance Plan (QAP). The purpose of the QAP is to ensure all equipment and processes are adequately inspected and assessed. The QAP is a separate document from the center manual and contains specific process measurements for evaluating all workloads, i.e., core inspections (CI), task evaluations (TE), quality verification inspections (QVI) and other inspections. The portion of the QAP containing the workload process measurements is written by product directorate planners assisted by CC-QA. Those measurements will be inserted into the QAP and managed by CC-QA. It is required that quality measures be assigned to all major workloads in AMARC per AFMCI 21-115. The QAP will contain the type of inspection, the quarterly frequency, and the baseline for the inspection area. In this way, the QAP will set a standard for quality maintenance. The QAP will significantly affect the overall quality of a process when managed and administered correctly. The baseline averages will be reviewed quarterly and the QAP will be reviewed in its entirety annually in accordance with AFMCI 21-115.

4. Additional CC-QA Responsibilities. The following lists additional areas of responsibility with a brief program definition:

- 4.1. In-Flight Emergencies (IFE)/Ground Aborts: CC-QA will respond to IFEs and ground aborts, as required. They will investigate the cause of the incident and determine if maintenance or material failure was a factor. They will coordinate with work center supervisors if changes in maintenance practices or processes are needed to prevent future occurrences.
- 4.2. Local Work Cards, Job Guides, Checklists, Etc: CC-QA will coordinate on all locally generated work cards, job guides and checklists. When necessary, CC-QA will coordinate with Headquarters, Air Force Materiel Command (HQ AFMC) concerning such items prior to approval. CC-QA does not have the authority nor will they approve such items that are not within HQ AFMC guidelines.
- 4.3. One-time Inspections (OTI): An OTI is a look-only or minor maintenance action to verify the existence of a suspect equipment condition or malfunction. OTIs can be initiated by higher headquarters, a weapons system manager, or local maintenance supervisor. OTIs may be for equipment condition or procedural compliance. OTIs may be done by CC-QA, work centers, or individuals selected by the initiating authority. If a decision is made to conduct a local OTI, the owning work center will write the inspection criteria to include technical order (TO) references. CC-QA will validate the OTI and assist with the process as necessary. CC-QA will monitor the OTI from start to finish. After the OTI is complete, CC-QA will assign a tracking number and attach a summary to the OTI. CC-QA will keep a copy on file for future reference.
- 4.4. Aircraft/Equipment Modifications: Any modification to aircraft/equipment will be coordinated with CC-QA. CC-QA will review the initial request and offer assistance to the owning work center.

After a request for modification has been approved, CC-QA will maintain a copy of the approval letter.

4.5. Kit Proofing of Time Compliance Technical Orders (TCTO): CC-QA will conduct an evaluation on all initial TCTO kit proofing. An AFTO Form 82, TCTOs/Kit Verification Certification, will be generated at the completion describing any problem areas identified during the proofing. A copy of this form will be kept on file. CC-QA will also evaluate all initial form fit projects.

4.6. Request for Quality Assistance (RQA). Quality assistance can be requested by anyone through their directorate by generating an AFMC Form 77, Request for Quality Assistance. The forms are completed and sent to the CC-QA office by the appropriate director. If the request is in the scope of the CC-QA role, an estimated completion date will be assigned based on priority of on-going tasks.

5. Types Of Inspections And Evaluations.

5.1. Task Evaluation (TE): A TE is an over-the-shoulder evaluation of a maintenance action or inspection performed on aircraft, missile systems, components, or support equipment by a technician or supervisor. TEs assess the technicians or supervisors job proficiency, degree of training and compliance with technical data. Individuals performing, supervising or evaluating maintenance tasks are subject to a TE. The TE starts when the individual begins the task or portion of the task to be evaluated and is complete when that task or portion of the task is finished. The individual being evaluated will be briefed prior to starting the task to include: notification that an evaluation is taking place; the performance standard for the task; the point at which the evaluation will begin and end. (The entire task need not be evaluated, but enough of the task to determine proficiency or compliance.) The individual will be briefed on the results upon completion. The inspector may give on-the-spot training or assistance in areas requiring improvement. When performing an evaluation, the evaluator determines if the technician or supervisor performed the job as prescribed by the published technical data and directives. The evaluator will review the individual's PAC record to ensure certification on the task.

Each PAC-certified technician will have at least one TE annually. TEs will be rated Pass or Fail. Per AFMCI 21-115 the individual or team will be decertified for a failed rating.

5.2. Quality Verification **Inspection (QVI)**: This is an evaluation of an item or process to determine the level of quality, relative to an established baseline. QVIs should be accomplished before equipment operation or use. Normally, this inspection does not require disassembly of parts, removing of stress panels, etc. The QVI report reflects weaknesses in the maintenance effort and points out where improvements in the process are required. Work cards, forms and other available documents will be reviewed as part of the QVI. The evaluator will check to ensure the maintenance was performed per technical data and was properly documented.

5.3. Core Inspection (CI): CIs are inspections that are common to all maintenance areas and should be done routinely. There is a listing of items considered CIs in AFMCI 21-115. This list may be expanded in the QAP and standards will be set for each. CIs can occur at any time and may be in conjunction with another inspection.

5.4. Other Inspections: Additional inspections that are recommended by the commander, quality assurance, or directorates that do not fall under the above categories. AFMCI 21-115, lists several examples.

5.5. Rating Evaluations: All evaluations will be rated according to the Quality Assessment Result (QAR) system per AFMCI 21-115. In addition, TEs will be rated as pass or fail. A failed TE rating

means the specific task was not performed within the determined quality standard. The rating applies only to the specific task and not to other tasks a technician is qualified to perform. Upon completion of a failed evaluation, the evaluator will provide on-the-spot feedback to identify and correct the failed areas. In addition, the individual will be decertified in that task per AFMCI 21-115. The following definitions are used in determining whether a rating is QAR 1, 2, or 3 and if a TE is rated as pass or fail.

5.5.1. **Major Discrepancy:** A discrepancy that renders the weapons system, support system, munitions, or support equipment unsafe for use or anything that will prevent the equipment from operating as it was designed. Other major discrepancies can include defects that could cause catastrophic results if not corrected. These could include items that require safety wire or cotter pins that are not installed, loose fittings/hardware, missing pins, foreign objects (FO), damage to equipment, etc. Major discrepancies will also include noncompliance with AFMC, AMARC, AF Occupational Safety and Health (AFOSH), and OSHA published instructions.

5.5.2. **Minor Discrepancy:** An unsatisfactory condition that is not dangerous enough to warrant grounding of the aircraft or discontinuing use of the equipment. Minor discrepancies will not make the inspection unsatisfactory unless there are enough minor defects to exceed the baseline average.

5.5.3. **Pass:** A pass rating will be given when there are zero major discrepancies or minor errors do not exceed the established baseline.

5.5.4. **Fail:** A fail rating will be given when an individual:

5.5.4.1. Fails to detect a major discrepancy while complying with an inspection or work card requirement.

5.5.4.2. Demonstrates a lack of technical proficiency or system knowledge.

5.5.4.3. Commits a safety or technical violation.

5.5.4.4. Fails to document maintenance actions in appropriate equipment records.

5.6. **Isolated Violation:** Violations will be broken down into two categories:

5.6.1. **Detected Safety Violation (DSV):** A safety violation that could cause death or injury to an individual or damage to aircraft/equipment.

5.6.2. **Technical Data Violation (TDV):** A violation of established Technical Data procedures (i.e., not in use, not available in work area, etc.).

6. Establishing A Baseline Average. A baseline average will be established for all inspections except task evaluations. A minimum of three inspections must be performed on the end item to establish an average. Only minor discrepancies will be used to calculate the baseline average. The average will be recalculated on a quarterly basis and published in the Quality Assurance Summary (QAS). The formula for calculating the average is:

$$\frac{\text{Total number of minor discrepancies}}{\text{Number of inspections performed on that task}} = \text{baseline average}$$

Example: Total number of discrepancies is 6 and total number of inspections is 3. The baseline average is 2.

7. AFMC Form 343, Quality Assurance Assessment : The AFMC Form 343 will be used to document all inspections and evaluations. CC-QA will annotate the form as directed on the reverse side of the form (blocks 1 - 18). All discrepancies will be documented with the reference used. Specific use of the AFMC Form 343 is contained in the QAP.

8. Data Collection: C-QA will use a local database to document all inspections and to write the monthly QAS. The data will be entered into the database not later than 5 working days after the routed copy is returned to CC-QA for filing. CC-QA will create products from this database to evaluate the program. CC-QA will use a local database until AFMC's Quality Information Module (QIM) is fully developed and CC-QA personnel are trained.

9. Executive Level Review Board: The executive level review board will convene quarterly. The AMARC Commander (AMARC/CC) will chair the board. It will also include all product directorates or their deputies and the Chief of CC-QA. Other members may attend as required by the commander, directorates or CC-QA. The board will review the previous month's inspection results and discuss trends, evaluate program performance, look at training issues, and discuss changes to the CC-QA manual or CC-QAP as necessary.

10. Quality Assurance Evaluator Training: The CC-QA evaluators will be trained prior to assuming inspector duties. An in-house course will be developed with the assistance of XPT and taught by CC-QA. The course will ensure all new evaluators have working knowledge of the programs/processes administered by CC-QA. The in-house training will be documented and maintained in CC-QA with coordination through Education and Training division. In addition, all CC-QA evaluators will stay proficient in their job series and will obtain additional training as necessary to perform their assigned duties. All formal training will be requested, documented and tracked by the Educational Training Management System (ETMS). Production Acceptance Certification program may be used to document an inspectors qualifications.

11. Technical Compliance Reviews: The Chief of Quality Assurance is responsible for planning, coordinating, and executing this annual review. Augmentees may be used as needed. Reviews will be performed, documented, and a report forwarded to HQ AFMC per AFMCI 21-132.

11.1. Conducting the Inspection. The manager responsible for the area being evaluated will be notified in writing at least 30 days prior to the proposed date. The manager will respond with a confirmation or propose an alternate date.

11.1.1. While conducting the inspection, the applicable checklist will be used to seek objective evidence demonstrating whether the activities or programs comply with mandated requirements. When a non-compliance is noted, it will be brought to the attention of, and discussed with, the responsible supervisor/manager. The safety office will be notified of all deficiencies or non-compliance issues relating to safety of personnel and/or government property.

11.1.2. Evaluation team members will be impartial, objective, and factual in their interactions with unit personnel and their observations. Specific references will be used to support each safety, procedural, and technical observation to aid the branch supervisor in using the audit as a management tool to correct problems or areas of concern.

11.2. Augmentees. The CC-QA office will conduct the majority of evaluations/inspections. However, augmentation of auditors may be necessary and will be formally requested at the directorate level. The selected team members will receive instructions from the CC-QA manager, and upon completion of the evaluation, team members will return to their normal duty assignments.

11.2.1. The CC-QA manager using analytical principles will evaluate the audits for adverse trends, training deficiencies, technical order defects, and/or process improvements. A summary of the program will be presented to the AMARC Commander and Board of Directors. All inspection reports will be kept on file in the CC-QA office for a period of 2 years.

11.2.2. Noted adverse trends and/or non-conformity will be addressed through the appropriate supervisors and concerned parties for corrective action or recommendations. In some cases, the CC-QA manager may require follow-up inspections.

11.3. Documentation and Record. Annual reviews will take the form of a report with findings and recommendations being documented on an AFMC Form 78, Deficiency Report. The results will be recorded in the format as follows:

- Finding (with reference).
- Recommendation (if any).
- Corrective actions may be requested, by suspense, from the CC-QA office depending on the criticality of the report. Implementation of the resulting corrective actions and follow-up audits will be documented on an AFMC Form 78. The CC-QA office will maintain a file of all audits, non-compliance, and follow-ups for a period of 2 years.

11.4. Corrective Action. Corrective actions may be implemented as required by the workcenter as long as they conform to written directives. The CC-QA office may evaluate the corrective action for implementation and effectiveness. The follow-up action may be recorded and tracked on AFMC Form 78. If more work is needed to fully implement the action, a new completion date will be agreed upon. Follow-up actions will be performed as required and close out remarks will be annotated.

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